A SHORT NOTE ON A TRANSITION IN CHROMIUM POTASSIUM SULPHATE ALUM

S. MITRA and S. K. DUTTA ROY*

DEPARTMENT OF MAGNETISM, INDIAN ASSOCIATION FOR THE CULTIVATION OF SCIENCE, CALCUTTA-32

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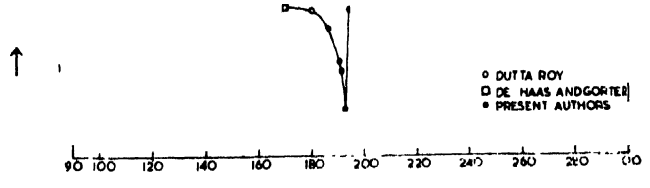
The single crystals of chrome alum $CrK(SO_4)_2 12H_2O$ being of the cubic class show no external magnetic anisotropy. The effective mean square moment (p_f^2) when smoothly plotted against temperature is very nearly a straight line with a small slope to the temperature axis (See Fig. I, de Haas and Gorter, 1930; Serres, 1932) owing to the contribution from high frequency paramagnetism. However, a small curvature with a flat minimum is found in this curve near 160°K which is confirmed by Dutta Roy (1956) from his close and more accurate observation between 200°K and 160°K with measurement at 20° intervals. Some anomalies near 200°K in dielectric absorption (Griffiths and Powell, 1952) and paramagnetic resonance (Bleaney, 1951) and a multiplication of lines in absorption spectrum from 290° to 77°K (Speding and Nutting 1934, Kraus and Nutting, 1941) have also been reported. We have, therefore, undertaken a detailed investigation of chrome alum with a new modified Curie balance and refined cryostatic system (Bose *et al.*, 1963) by means of which very accurate readings of susceptibility at intervals of a fraction of a degree can be taken. The p_f^2 -T curve is shown in Figure 1.



Temp. (°K)→

p_f^2 -T curve for $CrK(SO_4)_2 . 12H_2O$.

The general nature of the curve is same as that of earlier workers. But a sharp discontinuity in the curve is clearly shown at 192.5°K which the earlier workers missed as they took readings at comparatively large intervals though departure from linearity in this region was apparent. The above transition

* Formerly Pool Officer, Government of India; Present address : Department of Physics Indian Institute of Technology, Kharagpur.

is exactly reversible and reproducible with rising and falling temperatures. The deep violet colour of the crystal was observed to become light pink after the transition. The change in colour was also exactly reversible.

A detailed report of the work will be published very shortly elsewhere.

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